

# **Bulk Potable Water Hauling during Emergencies in the State of Kansas**



Bureau of Water  
Public Water Supply Section  
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## **Purpose**

This document provides guidance for public water supply systems and bulk water haulers on how bulk water hauling can be used to provide potable water that is safe and protects the health of the public during an emergency that causes an interruption of water service. Hauling water for drinking purposes is not regulated in the State of Kansas, but this document outlines safe and necessary measures to prevent the introduction of contamination throughout the process of bulk potable water hauling.

When other alternatives are not feasible, or cannot provide an adequate amount of potable water, hauled water may be considered as a temporary solution to the interruption of a public water supply system's access to potable water. Regardless of the circumstances, the transporting of potable water must not constitute a threat to public health. Hauled potable water must continue to comply with the same state and federal drinking water standards that would normally apply to public water systems.

Before initiating bulk water hauling operations, the water system must first notify the Kansas Department of Health and Environment (KDHE) and confirm that bulk water hauling is an appropriate solution to the current situation or emergency.

Public water supply systems are encouraged to utilize the services of milk haulers licensed by the Kansas Department of Agriculture, though other food grade bulk hauling tank trucks may be used. Trucks that have previously been used for other than food grade hauling may not be used to haul potable water.

## **Definitions**

Potable water – Water that is safe for human consumption and use and complies with state and federal drinking water standards.

Emergency – A case in which potable water must be hauled by tank truck on a temporary basis when the Kansas Department of Health and Environment determines that a public water supply has been compromised and cannot operate effectively.

Public Water Supply System – K.S.A. 65-162a(b) defines a public water supply as "... a system for the provision to the public of piped water for human consumption, if such system has at least ten (10) service connections or regularly serves an average of at least twenty-five (25) individuals at least sixty (60) days out of the year..."

## **Source of Potable Water**

The source of supply of water for bulk hauling must be from a public water supply system as defined in K.S.A. 65-162a(b) and regulated by the State of Kansas. The public water supply system serving as the source of bulk potable water must be in compliance with all requirements of federal drinking water regulations for public water supply systems.

When possible, the supplying system should use the same type of chlorine residual as the receiving system, i.e. free chlorine or combined chlorine.

## **Bulk Potable Water Hauling on a Repeated Basis**

If the tank or equipment is used to deliver at least one load of potable water on consecutive days, it need not be re-cleaned and re-disinfected between hauls, provided that the cleaning and disinfection procedure was carefully followed and that the tank and its related equipment and appurtenances continue to be adequately disinfected and not subject to any contamination. Tank and equipment must be cleaned and disinfected at least once every 3 days during repeated water hauling operations.

Each load must continue to be tested to ensure the presence of a sufficient chlorine residual. Additionally, each load must be tested for the presence of coliform bacteria.

If it is suspected that contamination has been introduced to the tank or appurtenances, they must be cleaned and disinfected prior to delivery of the next load of potable water.

## **Cleaning and Disinfection**

A Kansas licensed milk tank truck cleaning facility is recommended for the cleaning and disinfection of bulk hauling tank trucks before use for bulk potable water hauling. The licensed milk tank truck cleaning facility will supply a wash sticker to be used as proof of proper washing. If a licensed milk tank truck cleaning facility is not available, other facilities may be used, so long as the procedures for cleaning and disinfection in this section are followed.

At all times, a wash tag must be available for inspection and must contain the date and time of last cleaning, location and contact information for where the cleaning took place, and the signature of the person who washed and disinfected the bulk hauling tank.

Cleaning and disinfection are required before each load, except during repeated hauling, as previously described.

## **Cleaning**

The procedure for cleaning and disinfecting bulk water hauling tanks is as follows:

1. Drain the tank completely.
2. Clean the tank and its equipment with a mixture of detergent and potable water using a clean brush or high-pressure water jet. Warm or hot water should be used whenever possible.
3. Rinse with potable water using a water jet until the water draining from tank is detergent free.

The procedure for cleaning hoses, connectors, pumps, and related equipment is as follows:

1. Prepare a mixture of detergent and potable water.
2. Flush all hoses, connectors, pumps, and related equipment with the detergent mixture.
3. Rinse all equipment with potable water until the rinse water is detergent-free.

## **Disinfection**

A chlorine solution must be used to disinfect all interior surfaces which will be or may be in contact with potable water. All chemicals used must be NSF 60 product certified. Regular household liquid bleach may only be used if it is both unscented and carries the NSF Standard 60 product certification. The strength and age of sodium hypochlorite must be taken into consideration when preparing a solution for disinfection. Verify the concentration of sodium hypochlorite being used to prepare the solution to be utilized for disinfection. Table I is provided in Appendix A as a guide to illustrate how to make different concentrations of free chlorine disinfectant solutions.

The bulk hauling tank must be disinfected by one of the following methods:

1. Disinfect the tank by full contact method by filling to overflow level with potable water, then add disinfectant solution to provide a free chlorine residual in the full tank of not less than 10 mg/L. Let the tank truck sit closed, sealed, and locked, undisturbed for 6 hours. See Table I for information on how to prepare this solution. After disinfection and draining, thoroughly rinse tank with potable water.
2. Disinfect tank by spraying or painting the disinfectant solution directly onto all interior tank surfaces, including both water-contact and non-water contact surfaces. Continue this method for a minimum of 30 minutes to ensure the full disinfection of the tank. Spraying or painting method of disinfection of a tank should take place with a 200 mg/L chlorine

solution. See Table I for information on how to prepare this solution. After disinfection and draining, thoroughly rinse tank with potable water.

Hoses, pumps and other appurtenances must be disinfected by the full contact method.

Do not discharge the highly chlorinated solution used for disinfection onto the ground or into surface water. For instructions on neutralizing various residual chlorine concentrations before discharge, see Table II in Appendix A. Contact the Public Water Supply Section at KDHE with any questions regarding the safe handling and discharge of highly chlorinated water.

## **Bulk Potable Water Hauling Procedure**

At no point in the bulk potable water hauling process can public health and safety be compromised due to improper handling. Bulk potable water must not be stored for any length of time beyond which it's consumption by the public would pose a health risk. Water stored in bulk hauling tank trucks must maintain a chlorine residual of at least 0.2 mg/L free chlorine, or 1.0 mg/L combined chlorine at all times.

The bulk potable water being hauled must be tested for coliform bacteria during tank loading and before the tank is unloaded. Since coliform testing may take considerable time to receive results, understand that during an emergency, coliform testing is to serve as a post-delivery confirmation that water quality was protected. If test results show the presence of coliform bacteria, the public water supply system must notify KDHE immediately.

All piping, hoses, pumps and other appurtenances that are in contact or may come into contact with potable water during the loading and unloading process must be NSF 61 product certified.

### **Loading Tank with Potable Water**

1. The chlorine residual must be tested and recorded at the beginning and end of tank loading. After the tank is loaded, the chlorine residual must be at least 1.0 mg/L free chlorine or 1.5 mg/L combined chlorine.
2. When possible, the tank should be filled through a physical airgap. If filling through an airgap is not feasible, a backflow prevention device must be used.
3. If filling through an airgap is not feasible, a direct connection to a fire hydrant is an acceptable alternative. The fire hydrant must be flushed, and the chlorine residual checked before the first use of the day. All connections must be swabbed with 1% chlorine solution.
4. After loading the water, all bulk water hauling tank openings must be closed, tightly sealed, and locked until the water is unloaded.

5. All pumps and hoses must be capped and stored off the ground when not in use.

### **Unloading Potable Water**

1. Prior to unloading, measure and document the chlorine residual in the potable water being delivered.
2. If the chlorine residual measured is less than 0.2 mg/L free chlorine, or less than 1.0 mg/L combined chlorine, the tanked water may not under any circumstances be unloaded for potable use. The water must be disposed of in accordance with state law.
3. If the chlorine residual measured is greater than 0.2 mg/L free chlorine, or 1.0 mg/L combined chlorine, but is less than the residual required by the public water supply system receiving the tanked water, then the chlorine residual must be adjusted to levels acceptable to the receiving system before the water is unloaded for potable use.
4. Swab any connections with 1% chlorine solution.
5. The preferred location to unload potable water is into a finished water clearwell. Clean the area around the manhole cover before opening it to minimize the introduction of contamination into the system. Unload the potable water into the finished water clearwell using a physical airgap.
6. If unloading potable water at a finished water clearwell is not feasible, direct connection to a fire hydrant may be utilized. A backflow prevention device must be used.

### **Documentation**

Documentation must be made available for inspection upon request regarding the topics below.

1. Cleaning and Disinfection
2. Bacteriological monitoring and chlorine residual test results
3. Prior use of the bulk hauling tank

The public water supply system must keep documentation for a period of one year following the date of delivery of the hauled water.

## **Filling of Individual Containers**

During an emergency, customers may wish to fill individual containers such as a 5-gallon jug from the tank truck. When filling individual containers, a physical air gap must always be used, and the containers should be filled by a member of the public water supply system staff to reduce the risk of contamination to the water supply.

It is recommended that individual containers be food grade, durable material, and able to seal tightly. Customers should clean and disinfect their containers prior to filling using potable water and household bleach. Containers that have previously been used to store toxic or non-food grade substances such as pesticide should not be used.

The Center for Disease Control (CDC) recommends using the following steps to clean and sanitize water storage containers.

1. Wash the container and rinse completely with water.
2. Sanitize the container with a solution made by mixing 1 teaspoon of unscented liquid household chlorine bleach in one quart of water. Use bleach that contains 5-6% sodium hypochlorite.
3. Cover the container tightly and shake it well. Make sure the sanitizing bleach solution touches all inside surfaces on the container.
4. Wait at least 30 seconds and then pour the sanitizing solution out of the container.
5. Let the empty sanitized container air-dry before use OR rinse the empty container with safe water (water that has been treated).
6. Pour clean water into the sanitized container and cover with a tight lid.

It is the public water supply system's responsibility to communicate this information to customers who wish to fill individual containers.

## Appendix A

**Table I. Mixing Chlorine Solutions Per 1000 Gallons of Water Using Liquid Sodium Hypochlorite (5.25% and 12.5%)**

Desired Chlorine Concentration (mg/L)	Amount of 5.25% NaOCl per 1000 Gal H <sub>2</sub> O	Amount of 12.5% NaOCl per 1000 Gal H <sub>2</sub> O
1	0.3 Cup	2.0 Tablespoons
3	0.9 Cup	0.4 Cup
5	1.5 Cups	0.6 Cup
10	3.0 Cups	1.3 Cup
200	3.8 Gallons	1.6 Gallons

**Table II. Neutralizing various chlorine concentrations per 1000 gallons of water**

Residual Chlorine Concentration (mg/L)	Chemical Required			
	Sulfur Dioxide	Sodium Bisulfite	Sodium Sulfite	Sodium Thiosulfate
1	3.6 g	5.4 g	6.4 g	5.4 g
10	1.3 oz	2.0 oz	2.3 oz	1.9 oz
25	3.3 oz	5.0 oz	5.8 oz	4.8 oz
50	6.7 oz	10.0 oz	11.7 oz	9.6 oz
200	1.7 lb	2.5 lb	2.9 lb	2.4 lb